

AltEn Facility in Mead, Nebraska: Brief summary of publicly available information and data

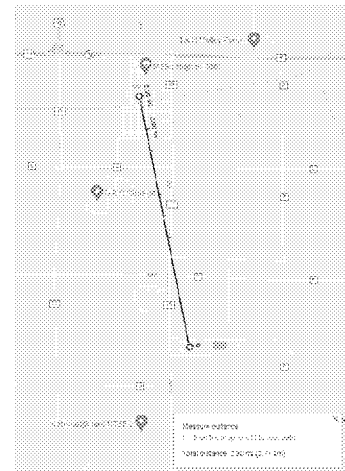
John T. Sloop
10/25/2021

Sources:

- Information and Updates for AltEn near Mead, Nebraska (Nebraska Department of Environment and Energy, <http://dee.ne.gov/Press.nsf/pages/AltEn>)
- Nebraska Enterprise Content Management Portal (an Official Nebraska Government Website, <https://ecmp.nebraska.gov/publicaccess/viewer.aspx?MyQueryID=340>)
- South Dakota Agricultural Laboratories (<http://www.southdakotaagriculturallaboratories.com/>)
- AltEn Environmental Pollution (University of Nebraska Medical Center, <https://www.unmc.edu/publichealth/departments/environmental/mead/>)
- Environmental and Ecological Health Monitoring of Neonicotinoid Insecticides and multiple classes of fungicides originating from the AltEn Facility Mead, Nebraska (University of Nebraska Lincoln, Project Proposal)

Background

- In 2015, AltEn ethanol plant began recycling pesticide treated seed corn as their feedstock
 - Facility is located about 2 miles south of Mead, Nebraska
- The plant produced and stored a significant amount of wastewater, as well as distillers grain (wetcake)
- 33,000 tons of wetcake were applied to cropland in 2018, with additional application occurring during 2019 and 2020
 - An additional 84,000 tons of wetcake stored onsite
- Approx. 176 million gallons of wastewater stored onsite



Distillers grain

- Distillers grain is a byproduct of ethanol production
- Often used as animal feed
- However, because material on AltEn's property contains neonicotinoids, it is not suitable for animal feed
 - Nebraska Dept. of Ag. has prohibited its use as a soil treatment



As of October 7, 2021: The **AltEn Facility Response group** has finished consolidating two piles of distillers grain. Distillers grain from the facility's eastern pile (pictured above before, during, and after the consolidation) was moved to the facility's northwest pile.

Distillers grain Analysis – April 13, 2021

- Analysis of actual distillers grain (wetcake) by SDAL
 - Looked for 35 chemicals
- Found extremely high levels of 17 different pesticides, including various neonicotinoids, insecticides, and fungicides

Chemical	Wet Cake #1 (ppb)	Wet Cake #2 (ppb)	Wet Cake #3 (ppb)
Abamectin	3220	1370	2850
Azoxystrobin	2620	2740	2090
Clothianidin	18300	217000	101000
Desthio-Prothioconazole	1670	3180	1800
Difenoconazole	407	1470	1730
Fluxasstrobin	60700	62700	48500
Glufosinate	74.3	147	99.5
imidacloprid	323	737	1060
ipconazole	7400	6260	5860
Metconazole	23.6	ND	ND
Prothioconazole	6620	3560	5120
Pyraclostrobin	484	ND	233
Sulfonic Acid Prothioconazole	260	303	190
Tebuconazole	3900	20600	6300
Thiabendazole	40600	49200	37100
Thiamethoxam	154000	33300	15300
Trifloxystrobin	1100	5010	2160

“Biochar” Analysis – March 31, 2021

- AltEn facility began using a biochar unit to process some of the distillers grain that was stored onsite
 - A biochar unit typically chars biomass, with the resulting material usually intended to be used as a soil amendment
- Preliminary test results indicated that biochar process *did not* fully remove pesticides from the distillers grain
 - NDEE continues to consider the biochar a solid waste as defined by Nebraska Administrative Code *Title 132*
 - Told to either re-process the biochar to see if pesticides are fully removed after an additional biocharring process, or to relocate it to the grain storage building

Wastewater Analysis – July 20, 2021

- Wastewater analysis, looked at 53 chemicals (Pacific Agricultural Laboratory in Sherwood, Oregon)

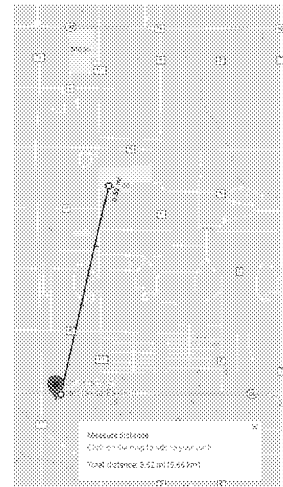
Analyte	Before Treatment (ug/L)	After Treatment (ug/L)	LOQ (ug/L)
Abamectin	11	ND	1.0
Azoxystrobin	6.5	ND	1.0
Carboxin	2.3	ND	1.0
Chlorantraniliprole	140	ND	1.0
Clothianidin	10	ND	1.0
Fludioxonil	1.1	ND	1.0
Fluxastrobin	92	ND	1.0
Ipconazole	2.2	ND	1.0
Mefenoxam	140	ND	1.0
Propiconazole	2.3	ND	1.0
Prothioconazole	1.8	ND	1.0
Tebuconazole	51	ND	1.0
Thiabendazole	29	ND	1.0
Thiamethoxam	1.3	ND	1.0



New water storage tanks on AltEn property. Used to store wastewater, either before or after treatment.

Groundwater results – March 4, 2021

- Nebraska Dept. of Environment and Energy (NDEE) sampled six public water supply wells (two wells from Univ. of Nebraska-Lincoln Eastern Nebraska Research and Extension Center, two wells at Nebraska National Guard training site, two wells connected to Mead's public water system) and four private wells
- Results (from SADL) show non-detectable levels of neonicotinoids, strobins, and azoles for all sampled wells

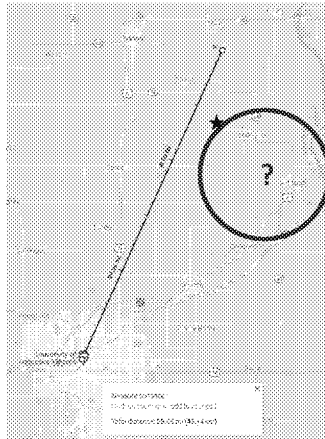


UNL-ENREC located about 3.5 miles from AltEn facility.

Groundwater results – April 13, 2021

- April 13, 2021: Five groundwater samples were collected (from private wells), chosen based on their proximity to the AltEn facility and known land application of both distillers grain and the facility's lagoon wastewater
- Groundwater samples tested by South Dakota Analytical Laboratories (SDAL)
- All five showed non-detectable levels for all compounds tested for

Groundwater results – August 19, 2021

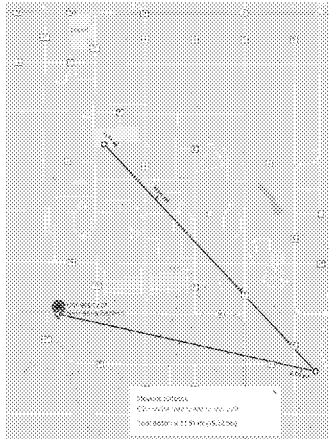


Starred location on map is location of
UNL Eastern Nebraska Research and
Extension Center (ENREC).

These results (below) are for a groundwater sample collected from a well owned by UNL-ENREC. This well is just over 3.5 miles away from the facility. I'm assuming this must have been "close" to some farm land that had the wetcake applied to it.

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation
8/06/21	8/6/21	Clothianidin	0.071 ug/L	0.060 ug/L

Groundwater results – October 20, 2021



These results (below) are for a groundwater sample collected from a private well (at 887 County Rd 5, Ashland, NE). This was chosen based on the proximity to the well mentioned previously (UNL-ENREC results reported on August 19, 2021). This well is just over 6 miles away from the facility, and 5.5 miles away from UNL-ENREC.

Compound	Sample Result micrograms/liter (ug/L)	Human Health Benchmark for Drinking Water (ug/L)
Clothianidin	1.7	630
Thiamethoxam	87	77
Metoloxam	0.058	4/4
Chlorantraniliprole	0.062	10,100

Summary

- Distillers grain (wetcake) is loaded with pesticides at extremely high concentrations
- Wastewater treatment seems to work well
- Conc. of pesticides in groundwater *potentially* rising
- **Proposed samples to collect:**
 - Distillers grain (wetcake), biochar of distillers grain, or both
 - Wastewater
 - Both before and after treatment
 - Groundwater
 - From either the UNL-ENREC well or a private well (potentially difficult)
 - Soil sample near the site